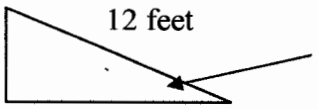
Practice Test#3
Geometry and Trigonometry

1. A cylindrical water storage tank must hold a volumetric capacity of 300,000 gallons to serve a population of 150 people. The commercial property where this tank must be built can only fit a tank with a diameter of 12 feet. How high in feet should the tank be constructed?

2. A fuel truck requires its tanks to be drained. Assume that the fuel truck is full to its capacity. It is exactly 30 minutes to closing time. A fuel pump has a pumping capacity of 120 gallons per minute. If the diameter of the tank is 15 feet and the height is 20 feet, will there be enough time to safely empty the truck before closing time.

3. Given the following values, calculate the angle indicated.



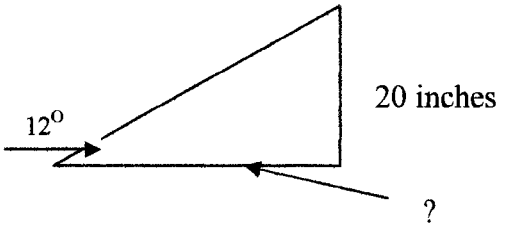
23 feet

4. What is the incline if a driveway rises 5 feet from ground level, and has a total driveway length of 35 feet?

5. Using the same problem as #4, what is the angle of the ramped driveway?

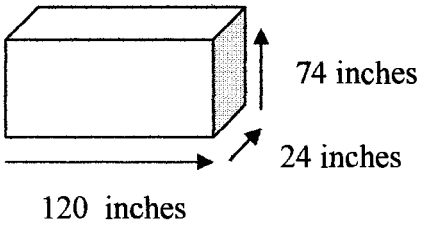
6. A storm is coming and all of the fuel tanker trucks are required to be emptied and purged. A fuel tanker truck with a radius of 12 feet and a height of 23 feet is full of fuel. With 2 fuel pumps both pumping at 110 gallons per minute, how long, expressed in minutes, will it take to empty the tanker?

7. Given the following right triangle, determine the length as indicated with the arrow.



8. If a room requires 55 m^3 of clean air per person and there is 250,000 cubic feet of air, how many people maximum is allowed to safely be in this room to work for an 8-hour day?

9. Given the following figure, how long would it take to fill the room with air (assuming it had no air to begin with) if the air compressor can only produce 23 cubic feet of air per minute.



10. An aircraft with an air speed of 550 miles per hour is meeting 90-degree crosswinds from the left. The crosswinds are about 55 miles per hour. What course correction (or angle relative to its current straight line heading) is required to compensate in order to reach its destination?

11. Safety section is conducting a design review of a fuel tank design. The tank is 130 feet in diameter at its base, and 55 feet high. The containment system must be able to hold 110% of the tank's fuel capacity, if there was a leak. Therefore, what is the maximum capacity that you should expect the containment system to hold in gallons?

12. A design engineer wants to design a ramp to the storage warehouse for forklifts to carry their loads. The ramp is 30 feet long and 4 feet high. The manufacturer of the forklift recommends a maximum incline of 6% when carrying its maximum load test capacity. Assuming that the forklifts are expected to carry up to their maximum load test, is this design within the manufacturer's recommendations?